CLAIMS

We claim:

1. A method in a computing system for updating the availability status attributed to predefined groups of offered items, comprising:

initializing a FIFO queue of item groups to be empty;

receiving a plurality of messages, each message identifying an offered item and indicating that the availability status of the identified item has changed;

in response to each received message:

identifying any item groups containing the identified item;

for each identified item group:

if the identified item group is not present in the queue of item groups, appending the item group to the queue;

when a timer expires:

for a predetermined number of item groups in the queue of item groups:

removing the item group from the queue of item groups;

updating the availability status attributed to the item group, based upon availability statuses of the items within the item group;

if, after removing the predetermined number of item groups, the queue of item groups is empty, setting a timer having a first duration; and

if, after removing the predetermined number of item groups, the queue of item groups is not empty, setting a timer having a second duration that is shorter than the first duration.

2. The method of claim 1 wherein the updating includes intersecting the availability statuses of the items within the item group.

3. The method of claim 1 wherein identifying any item groups containing the identified item includes accessing a list of item groups indexed by the items that they contain.

4. A method in a computing system for determining availability status for item groups each containing one or more items, each item having its own availability status, comprising:

for each item whose availability status changes, for each item group containing the item, adding the item group to a list of item groups if the item group is not already present in the list;

periodically removing a plurality of item groups from the list; and

for each item group removed from the list, determining an availability status for the item group based upon availability statuses of items contained in the group.

5. The method of claim 4 wherein each item group removed from the list is the item group earliest added to the group, but not yet removed.

6. The method of claim 4 wherein item groups containing a distinguished item are added to the list in response to receiving an asynchronous message indicating that the availability status of the distinguished item has changed.

7. The method of claim 6 wherein the availability status of the distinguished item is different when it is used to determine availability statuses for the item groups containing the distinguished item than when the item groups containing the distinguished item are added to the list.

8. The method of claim 4 wherein up to a predetermined maximum number of item groups are removed from the list in a single period.

9. The method of claim 8 wherein, if the predetermined maximum number of item groups are removed from the list in a single period, a shortened period is set before next removing item groups from the list.

10. A computer-readable medium whose contents cause a computing system to determine availability status for item groups each containing one or more items, each item having its own availability status by:

for each item whose availability status changes, selecting each item group containing the item;

at a distinguished time after item groups have been selected, for each of a plurality of selected item groups that were earliest selected:

determining an availability status for the item group based upon availability statuses of items contained in the group; and

deselecting the item group.

11. The computer-readable medium of claim 10 wherein an availability status for at least one selected item group is not determined at the distinguished time.

12. The computer-readable medium of claim 10 wherein no availability statuses are determined for unselected item groups at the distinguished time.

13. A computing system for determining availability status for item groups each containing one or more items, each item having its own availability status, comprising:

an item group addition subsystem that adds to a list of item groups, for each item whose availability status changes, each item group containing the item that is not already present in the list; and

an item group removal subsystem that periodically removes a plurality of item groups from the list, and, for each item group removed from the list, determines an availability status for the item group based upon availability statuses of items contained in the group.

14. One or more computer memories collectively containing a staging data structure for recomputing the availability of bundles of items, comprising:

for each of a plurality of bundles containing an items whose availability has changed since the availability of the bundle was last computed, information identifying the bundle,

such that the contents of the data structure may be used to select bundles for recomputation of their availability.

15. The computer memories of claim 14 wherein the data structure further contains information specifying an order in which the availability of the identified bundles is to be recomputed.

16. The computer memories of claim 15 wherein the information specifying an order in which the availability of the identified bundles is to be recomputed specifies the order in which the availability of contained items changed.

17. The computer memories of claim 15 wherein the information specifying an order in which the availability of the identified bundles is to be recomputed specifies for each identified bundle a time at which the identified bundle was submitted for recomputation.

18. The computer memories of claim 15 wherein the information specifying an order in which the availability of the identified bundles is to be recomputed specifies for each identified bundle a time at which the availability status of the first item containing the bundle changed subsequent to the last calculation of the availability status of the identified bundle.

19. The computer memories of claim 15 wherein the information specifying an order in which the availability of the identified bundles is to be recomputed specifies for each identified bundle a serial number specifying the identified bundle's position in the order.

20. The computer memories of claim 15 wherein the information specifying an order in which the availability of the identified bundles is the physical order of information identifying each of the identified bundles in the data structure.

21. The computer memories of claim 15 wherein the information specifying an order in which the availability of the identified bundles is a system of pointers between information identifying each of the identified bundles in the data structure.

22. The computer memories of claim 14 wherein the data structure is a queue of unique entries.

23. The computer memories of claim 14 wherein the data structure is a FIFO queue of unique entries.

24. A method in a computing system for updating availability information for group items each containing one or more individual items, comprising:

detecting each of a plurality of changes to availability information of individual items;

in response to each detected change to availability information of an individual item:

identifying group items containing the individual item; and

updating availability information of each of the identified group items using the current availability information for each of the individual items contained by the group.

25. The method of claim 24 wherein the detecting and identifying is performed in a first process, and wherein the updating is performed in a second process distinct from the first process.

26. The method of claim 24 wherein the detecting and identifying is performed by a first daemon, and wherein the updating is performed in a second daemon distinct from the first daemon.

27. The method of claim 24 wherein the detecting includes transmitting an asynchronous message for each detected change to availability information of an individual item.

28. The method of claim 27 wherein the identifying and updating is performed in response to receiving the transmitted asynchronous message.

29. The method of claim 24 wherein the detecting includes broadcasting to a plurality of recipients an asynchronous message for each detected change to availability information of an individual item.

30. The method of claim 24, further comprising adding the identified group items to a group item queue if not already present in the group item queue.

31. The method of claim 30 wherein availability information of group items in the group item queue is updated when a scheduling mechanism triggers the updating.

32. The method of claim 24 wherein the identifying and updating is performed immediately in response to the each detected change to availability information of an individual item.

33. The method of claim 24 wherein the identifying and updating is performed at a time later than each detected change to availability information of an individual item.

34. The method of claim 24 wherein the detecting includes receiving asynchronous messages each describing a cause for modifying availability information of an individual item.

35. The method of claim 24, further comprising, in response to a detected change to availability information of at least one individual item, for at least one of the group items identified as containing the individual item, transmitting an asynchronous message indicating the updated availability information for the group item.

36. The method of claim 24 wherein the updated availability information includes at least one of the following:

the number of units available to sell in the closest time bucket;

the identify of the closest time bucket in which units will be available to sell;

the range of error in the time bucket;

the source of the units that are available to sell;

whether units can be replenished if more are needed than are in the first time bucket;

a source from which units can be replenished if more are needed than are in the first time bucket;

the replenishment cycle for the item;

whether the item is suspended from sale; and

when stock in the item is expected to be exhausted.

37. The method of claim 24, further comprising broadcasting to a plurality of recipients an asynchronous message indicating the update of availability information for each of the identified group items whose availability information is updated.

38. A computing system for updating availability information for group items each containing one or more individual items, comprising:

a detection subsystem that detects each of a plurality of changes to availability information of individual items;

a group item identification subsystem that identifies, for each change to availability information of an individual item detected by the detection subsystem, group items containing the individual item; and

an update subsystem that updates availability information of each of the group items identified by the group item identification subsystem using the

current availability information for each of the individual items contained by the group.